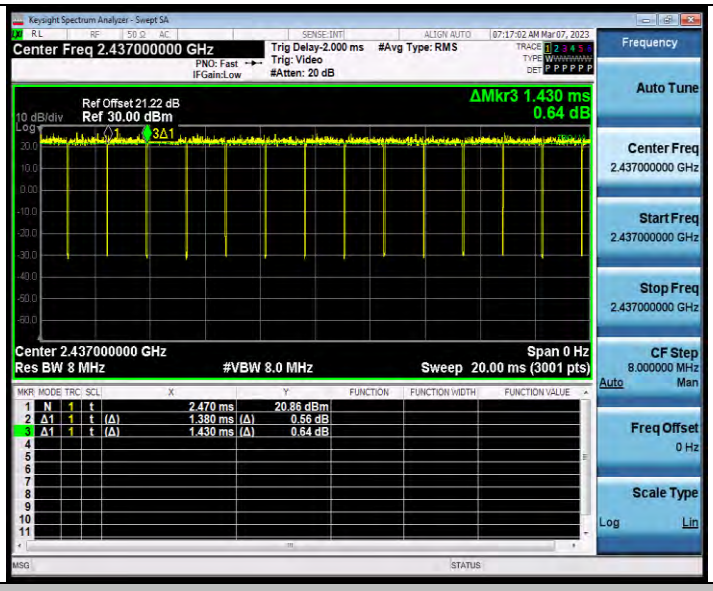
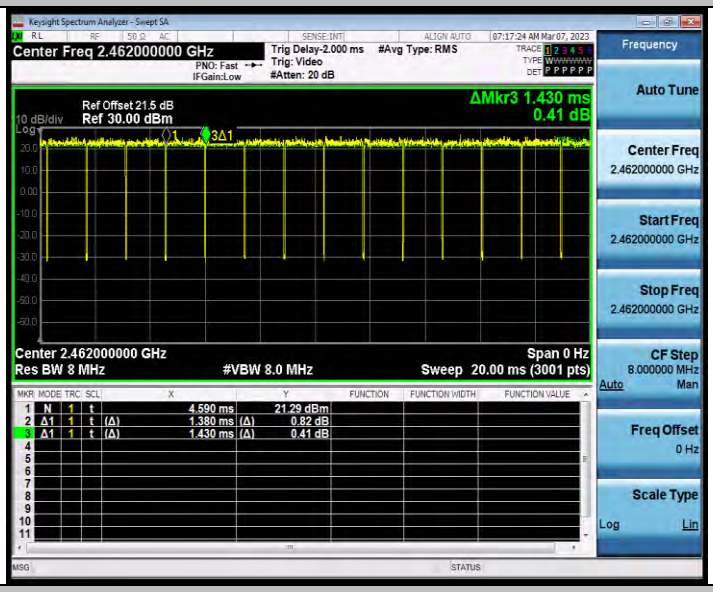
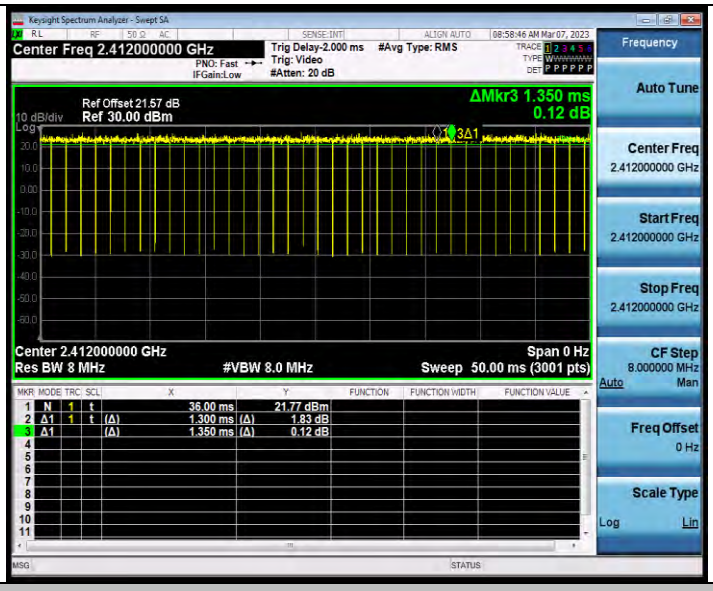


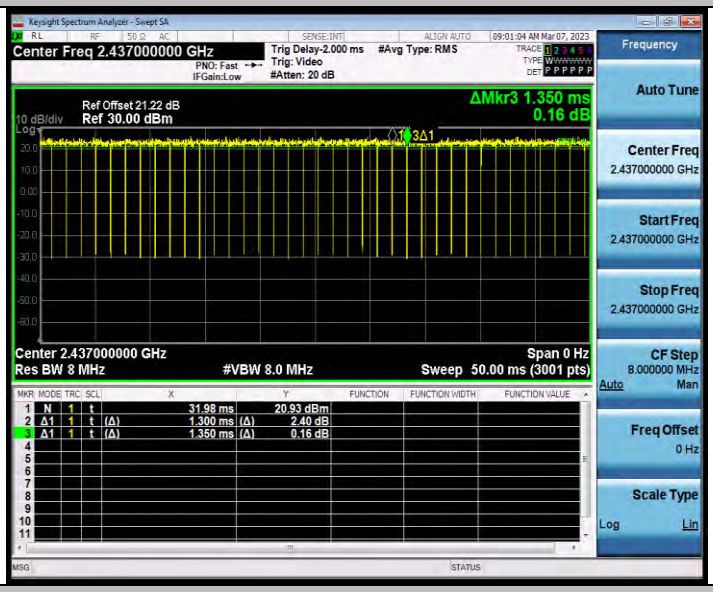
11G_Ant1_2462



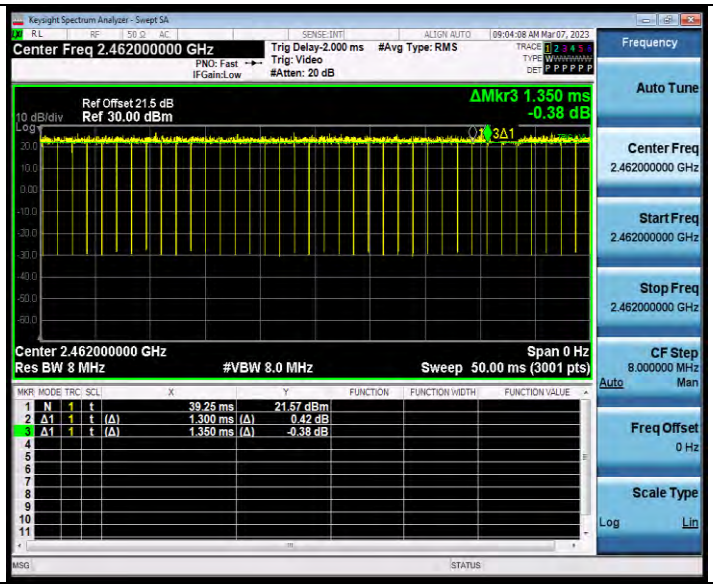
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 20 dB
09:04:08 AM Mar 07, 2023
Ref Offset 21.5 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 1.350 ms
-0.38 dB
Center 2.462000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 50.00 ms (3001 pts)
1 N 1 t 39.25 ms 21.57 dBm
2 Δ1 1 t (Δ) 1.300 ms (Δ) 0.42 dB
3 Δ1 1 t (Δ) 1.350 ms (Δ) -0.38 dB
Frequency
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.462000000 GHz
Stop Freq
2.462000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

7 APPENDIX 2 BLE

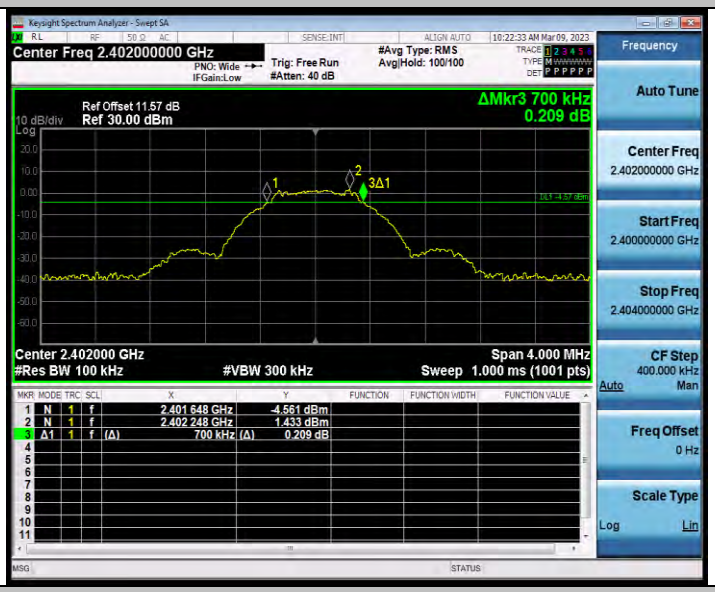
DTS BANDWIDTH

TEST RESULT

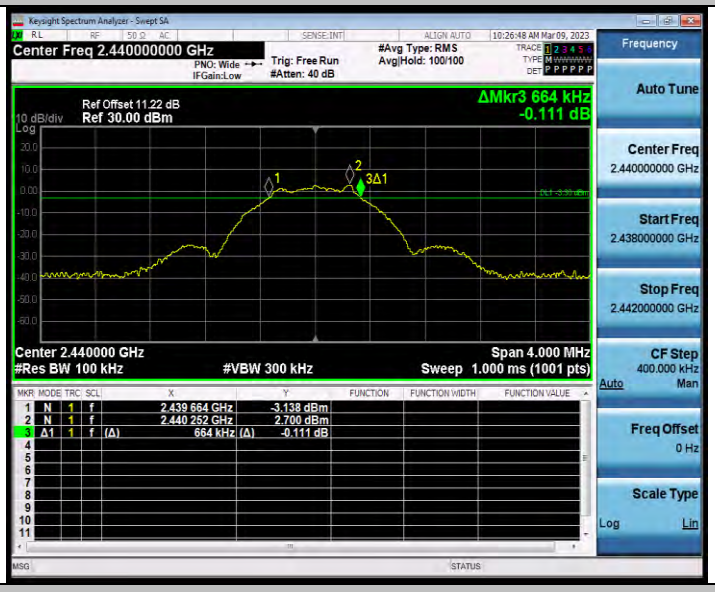
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.700	2401.648	2402.348	0.5	PASS
		2440	0.664	2439.664	2440.328	0.5	PASS
		2480	0.656	2479.664	2480.320	0.5	PASS
BLE_2M	Ant1	2402	1.240	2401.344	2402.584	0.5	PASS
		2440	1.212	2439.352	2440.564	0.5	PASS
		2480	1.216	2479.360	2480.576	0.5	PASS
BLE_125K	Ant1	2402	0.680	2401.660	2402.340	0.5	PASS
		2440	0.680	2439.660	2440.340	0.5	PASS
		2480	0.680	2479.660	2480.340	0.5	PASS
BLE_500K	Ant1	2402	0.720	2401.636	2402.356	0.5	PASS
		2440	0.676	2439.672	2440.348	0.5	PASS
		2480	0.660	2479.672	2480.332	0.5	PASS

TEST GRAPHS

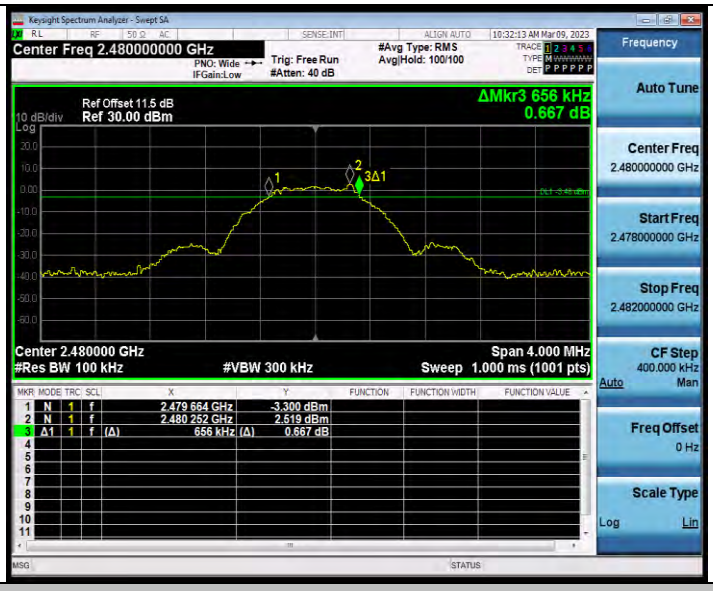
BLE_1M_Ant1_2402



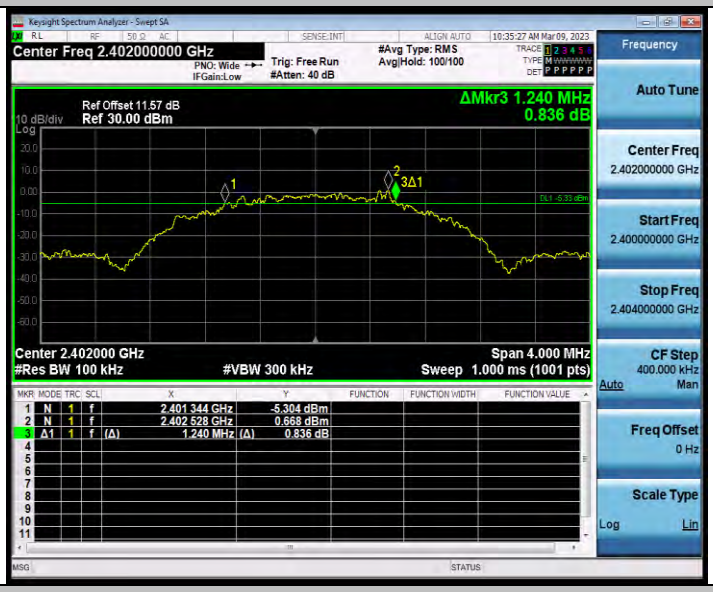
BLE_1M_Ant1_2440



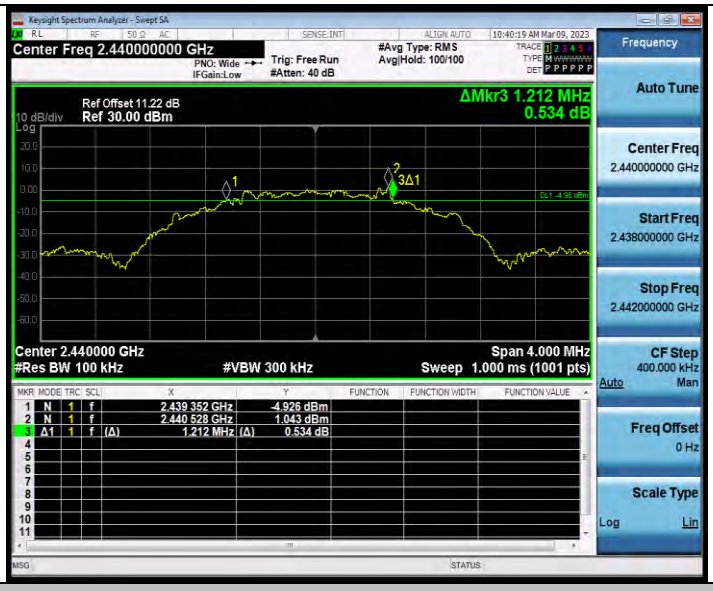
BLE_1M_Ant1_2480



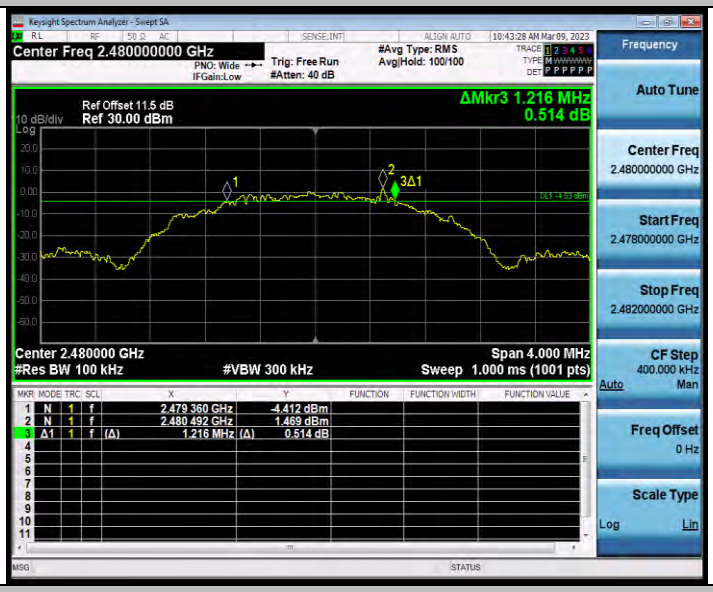
BLE_2M_Ant1_2402



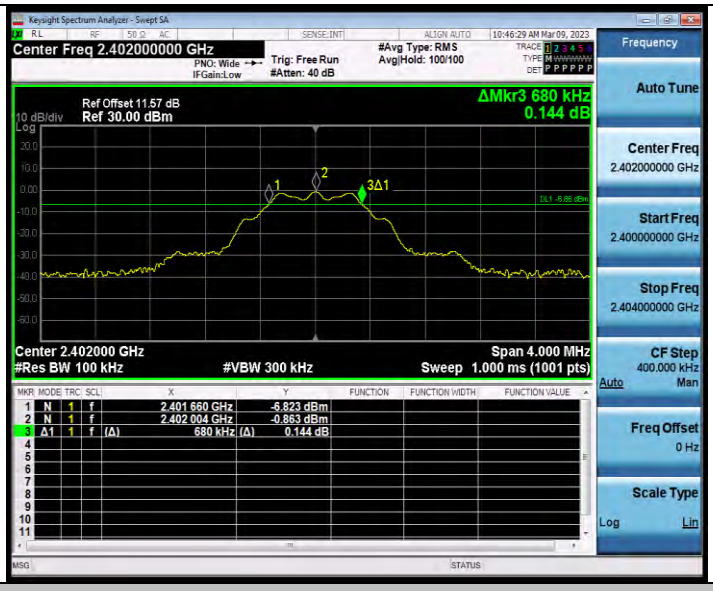
BLE_2M_Ant1_2440



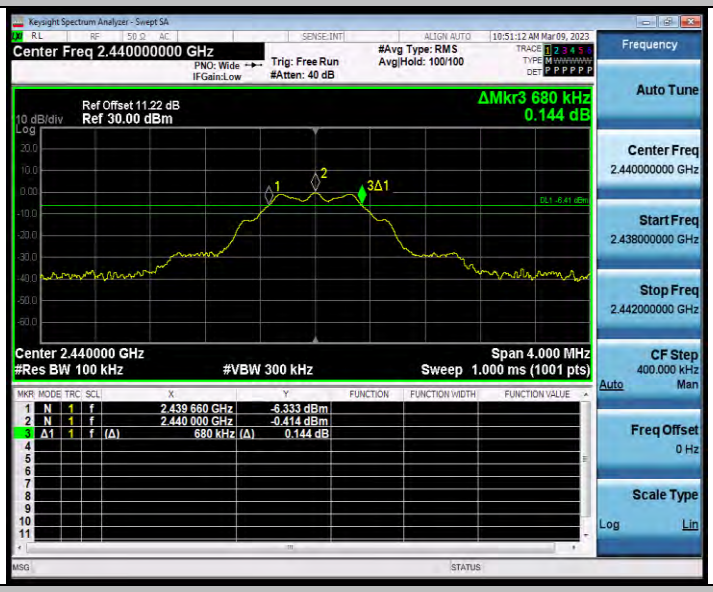
BLE_2M_Ant1_2480



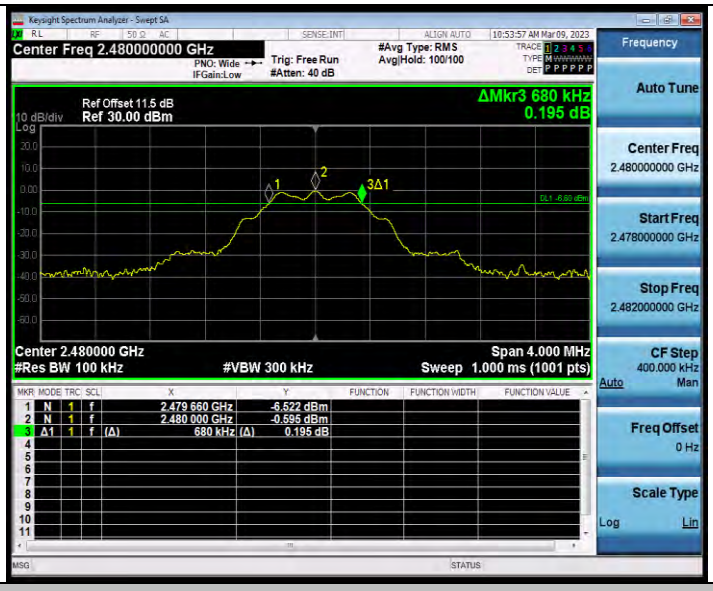
BLE_125K_Ant1_2402



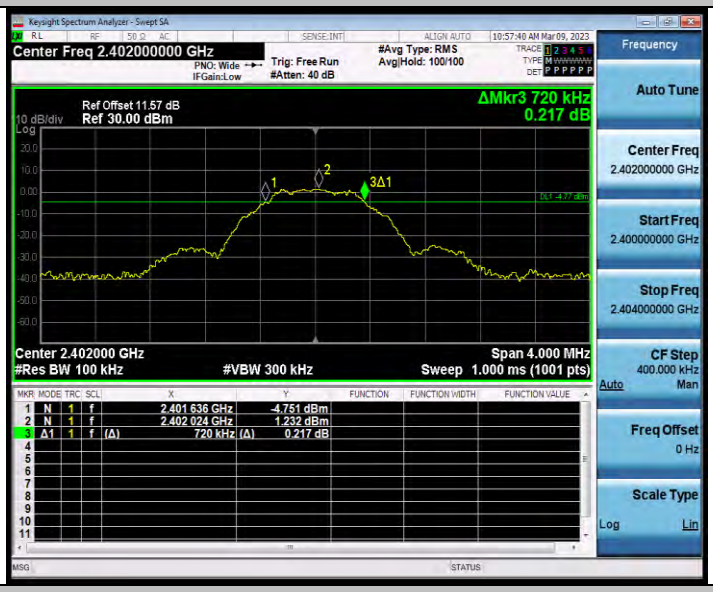
BLE_125K_Ant1_2440



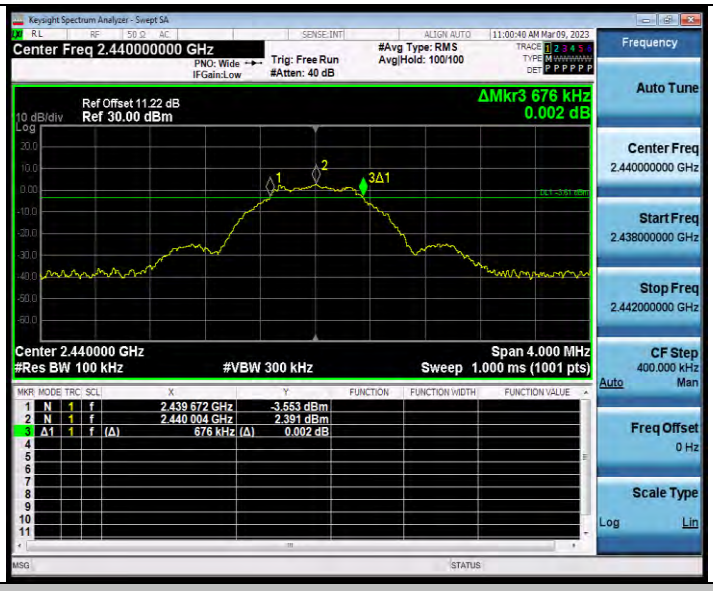
BLE_125K_Ant1_2480



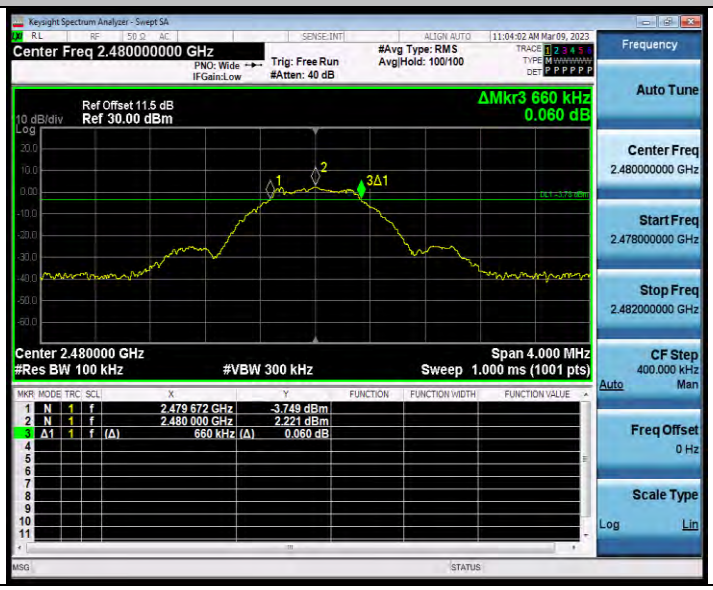
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480



OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0409	2401.4835	2402.5244	---	---
		2440	1.0340	2439.4881	2440.5221	---	---
		2480	1.0322	2479.4874	2480.5196	---	---
BLE_2M	Ant1	2402	2.0677	2400.9794	2403.0471	---	---
		2440	2.0873	2438.9753	2441.0626	---	---
		2480	2.0539	2478.9831	2481.0370	---	---
BLE_125K	Ant1	2402	1.0598	2401.4715	2402.5313	---	---
		2440	1.0579	2439.4729	2440.5308	---	---
		2480	1.0550	2479.4726	2480.5276	---	---
BLE_500K	Ant1	2402	1.0307	2401.4849	2402.5156	---	---
		2440	1.0338	2439.4865	2440.5203	---	---
		2480	1.0310	2479.4845	2480.5155	---	---

TEST GRAPHS

BLE_1M_Ant1_2402
BLE_1M_Ant1_2440
BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

BLE_125K_Ant1_2402

BLE_125K_Ant1_2440

BLE_125K_Ant1_2480

BLE_500K_Ant1_2402

BLE_500K_Ant1_2440

BLE_500K_Ant1_2480

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT

TestMode	Antenna	Channel	Average power [dBm]	Peak power [dBm]	Peak power [mW]	Conducted Limit [dBm]	EIRP [dBm]	EIRP [mw]	EIRP Limit [dBm]	Verdict	Power Setting
BLE_1M	Ant1	2402	1.09	1.6	1.45	≤30.00	-2.1	0.62	≤36	PASS	Defult
		2440	2.28	2.72	1.87	≤30.00	-0.98	0.80	≤36	PASS	Defult
		2480	1.93	2.12	1.63	≤30.00	-1.58	0.70	≤36	PASS	Defult
BLE_2M	Ant1	2402	1.59	1.74	1.49	≤30.00	-1.96	0.64	≤36	PASS	Defult
		2440	2.54	2.76	**1.89**	≤30.00	-0.94	0.81	≤36	PASS	Defult
		2480	1.85	2.17	1.65	≤30.00	-1.53	0.70	≤36	PASS	Defult
BLE_125k	Ant1	2402	1.25	1.58	1.44	≤30.00	-2.12	0.61	≤36	PASS	Defult
		2440	2.43	2.73	1.87	≤30.00	-0.97	0.80	≤36	PASS	Defult
		2480	1.73	2.13	1.63	≤30.00	-1.57	0.70	≤36	PASS	Defult
BLE_500K	Ant1	2402	1.12	1.59	1.44	≤30.00	-2.11	0.62	≤36	PASS	Defult
		2440	2.31	2.73	1.87	≤30.00	-0.97	0.80	≤36	PASS	Defult
		2480	1.67	2.17	1.65	≤30.00	-1.53	0.70	≤36	PASS	Defult
Note:EIRP=Peak Power+Gain											

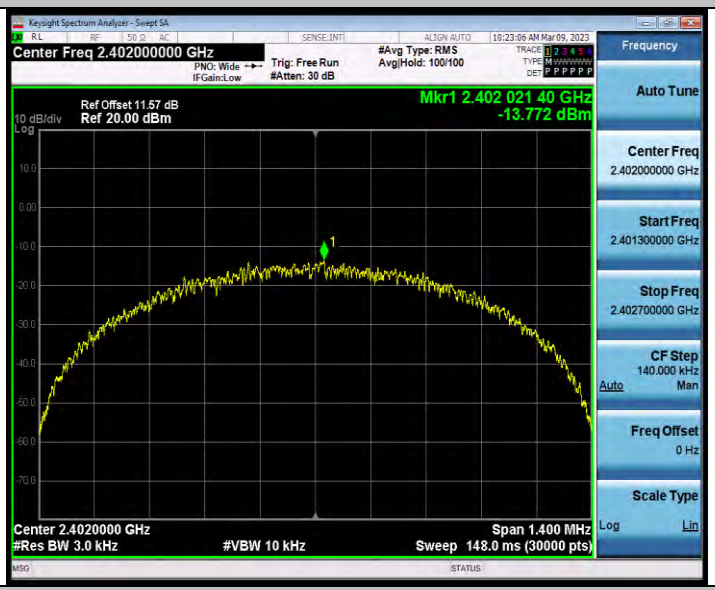
MAXIMUM POWER SPECTRAL DENSITY

TEST RESULT

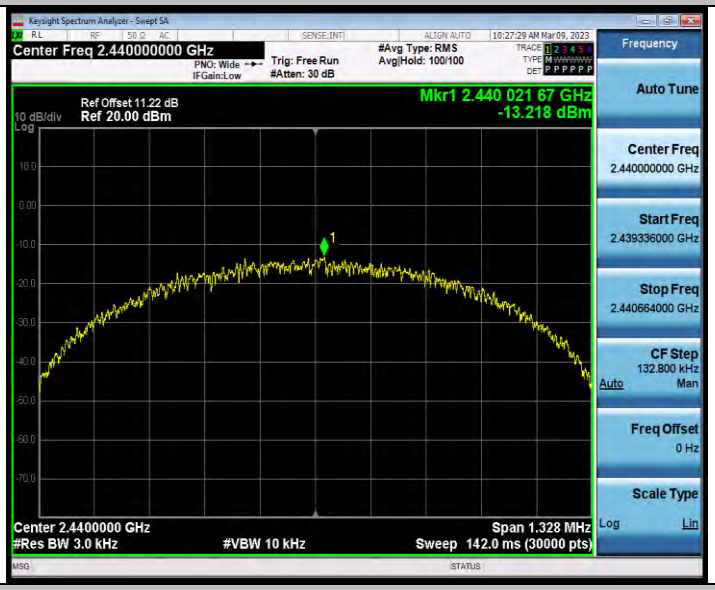
TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.77	≤8.00	PASS
		2440	-13.22	≤8.00	PASS
		2480	-13.28	≤8.00	PASS
BLE_2M	Ant1	2402	-16.1	≤8.00	PASS
		2440	-15.57	≤8.00	PASS
		2480	-15.65	≤8.00	PASS
BLE_125K	Ant1	2402	-3.79	≤8.00	PASS
		2440	-3.42	≤8.00	PASS
		2480	-3.52	≤8.00	PASS
BLE_500K	Ant1	2402	-3.91	≤8.00	PASS
		2440	-3.46	≤8.00	PASS
		2480	-3.48	≤8.00	PASS

TEST GRAPHS

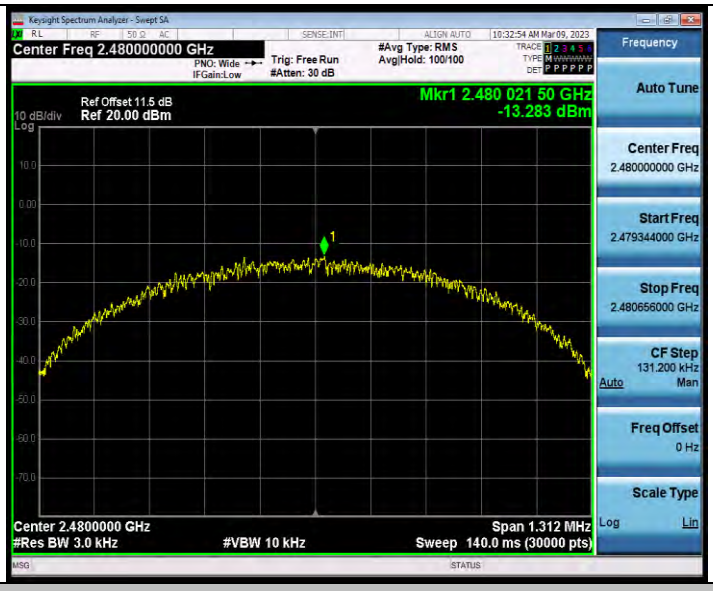
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

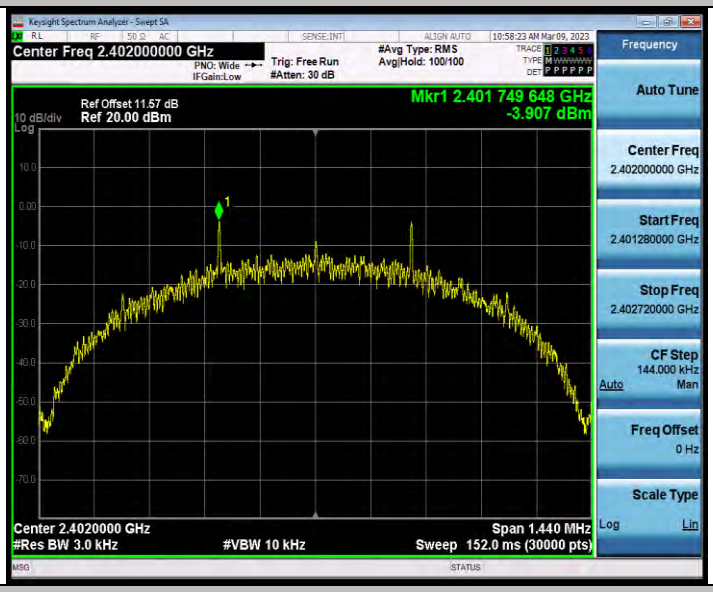
BLE_2M_Ant1_2480

BLE_125K_Ant1_2402

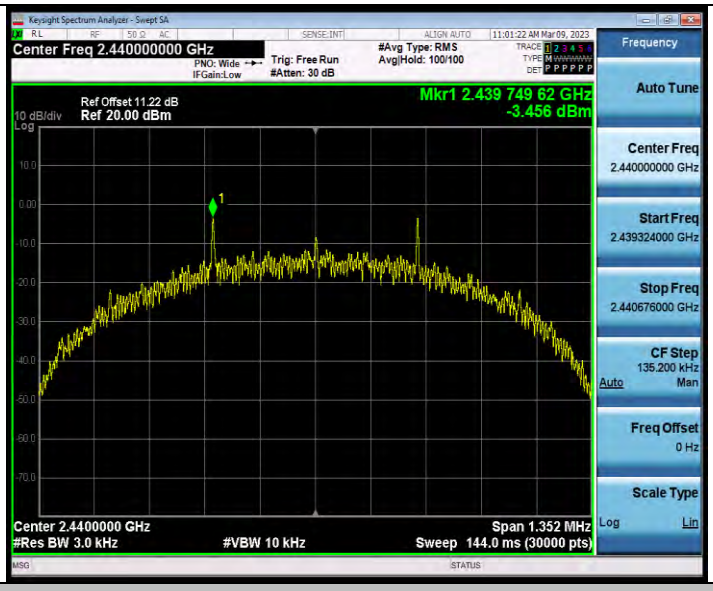
BLE_125K_Ant1_2440

BLE_125K_Ant1_2480

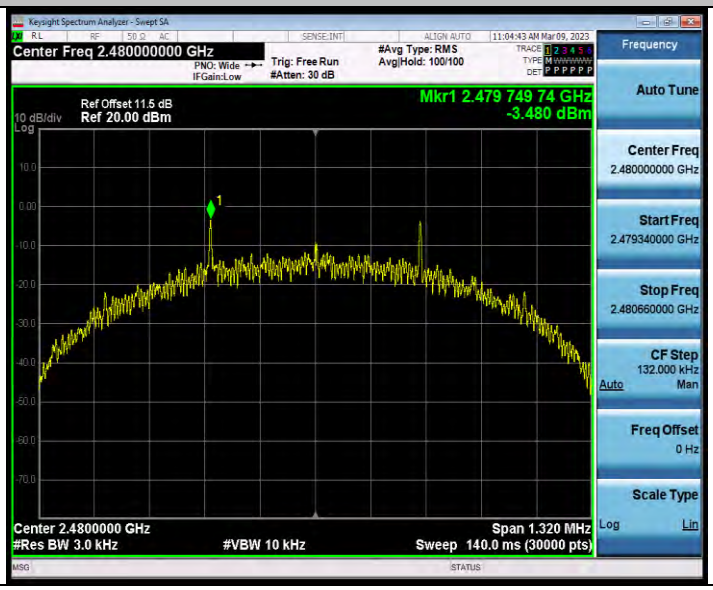
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480



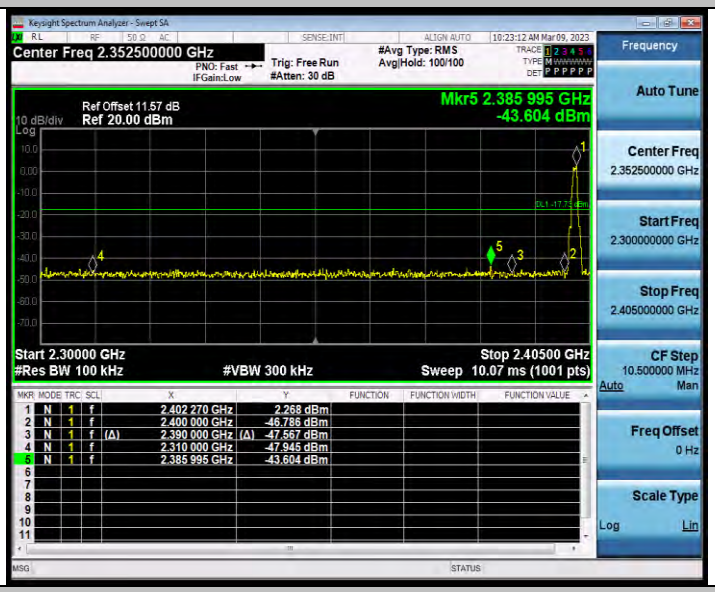
BAND EDGE MEASUREMENTS

TEST RESULT

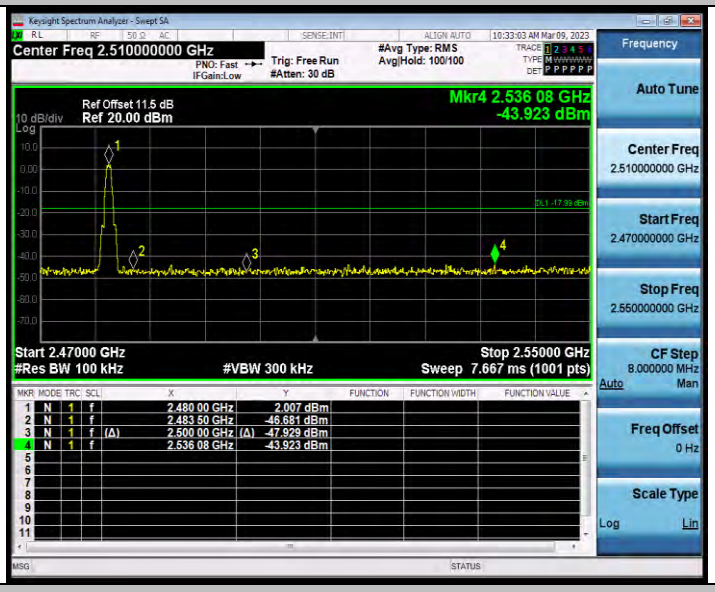
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.27	-43.6	≤-17.73	PASS
		High	2480	2.01	-43.92	≤-17.99	PASS
BLE_2M	Ant1	Low	2402	1.88	-26.87	≤-18.12	PASS
		High	2480	0.65	-44.28	≤-19.36	PASS
BLE_125K	Ant1	Low	2402	-0.84	-44.81	≤-20.84	PASS
		High	2480	-0.55	-43.99	≤-20.55	PASS
BLE_500K	Ant1	Low	2402	1.96	-44.34	≤-18.05	PASS
		High	2480	2.30	-43.5	≤-17.7	PASS

TEST GRAPHS

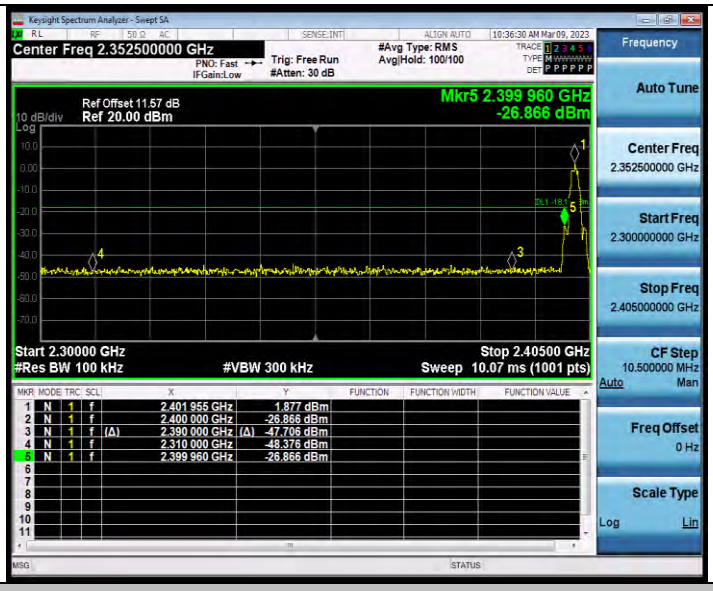
BLE_1M_Ant1_Low_2402



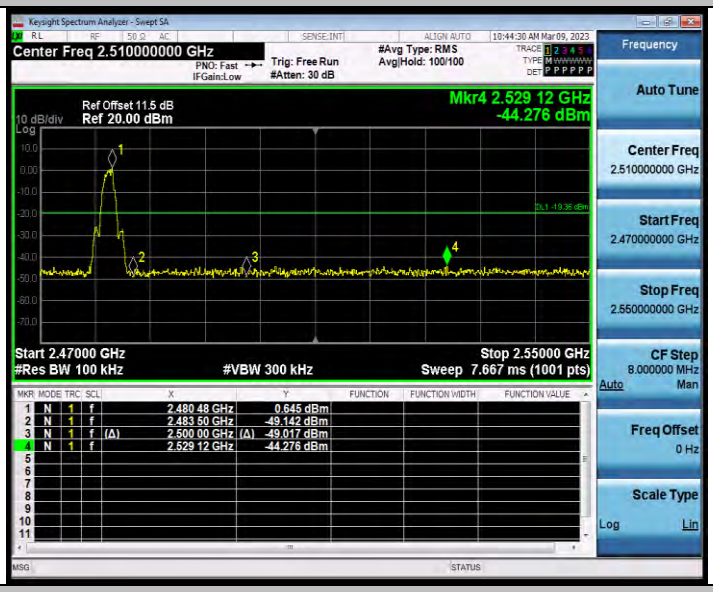
BLE_1M_Ant1_High_2480



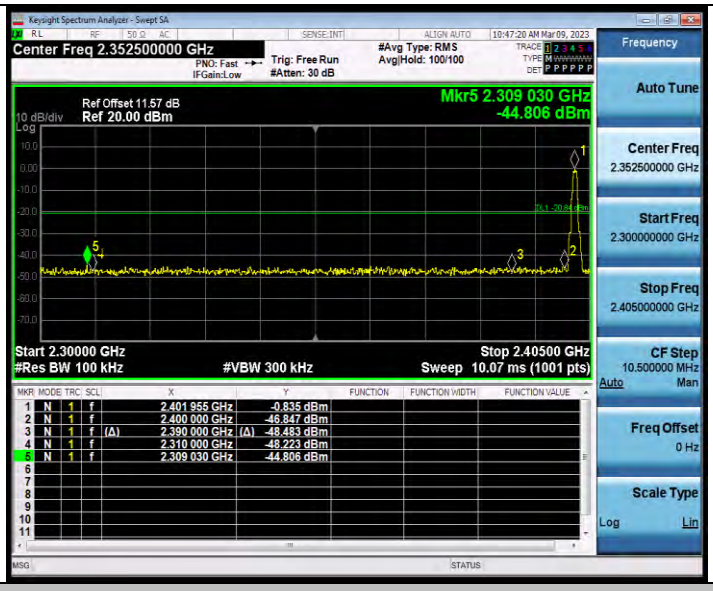
BLE_2M_Ant1_Low_2402



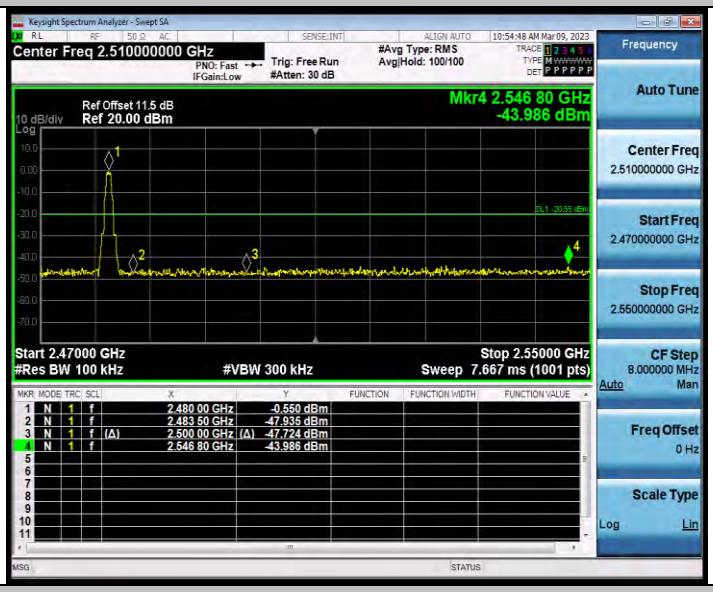
BLE_2M_Ant1_High_2480



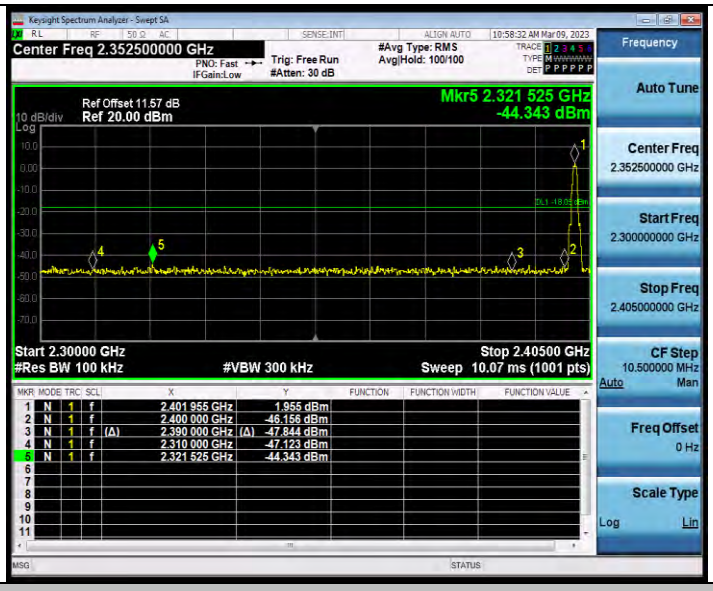
BLE_125K_Ant1_Low_2402



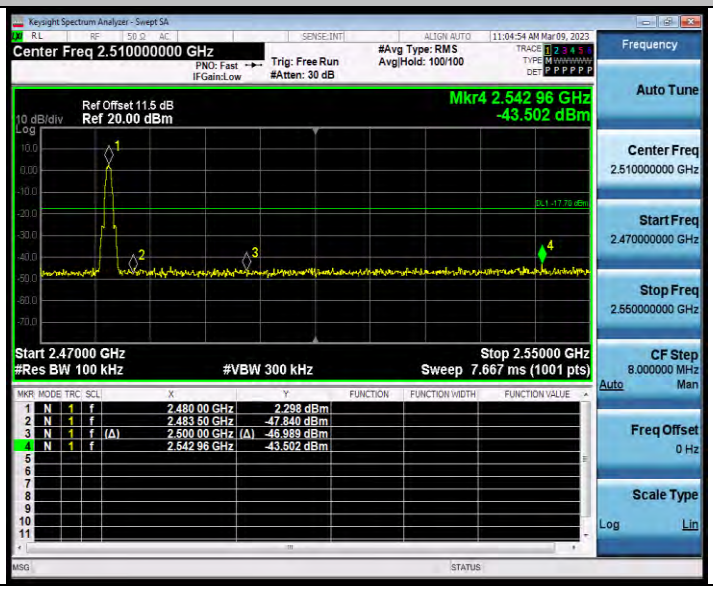
BLE_125K_Ant1_High_2480



BLE_500K_Ant1_Low_2402



BLE_500K_Ant1_High_2480



CONDUCTED SPURIOUS EMISSION

TEST RESULT

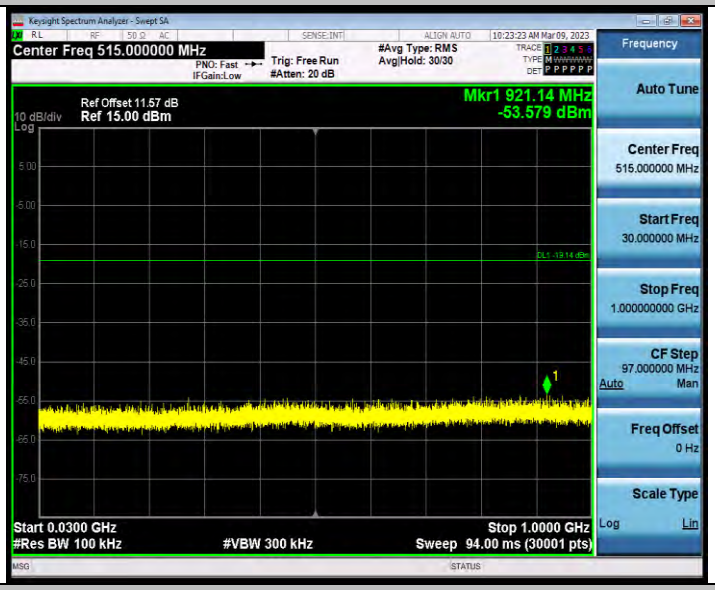
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.86	0.86	---	PASS
			30~1000	0.86	-53.58	≤-19.14	PASS
			1000~26500	0.86	-34.06	≤-19.14	PASS
		2440	Reference	1.94	1.94	---	PASS
			30~1000	1.94	-54.04	≤-18.06	PASS
			1000~26500	1.94	-33.69	≤-18.06	PASS
		2480	Reference	2.24	2.24	---	PASS
			30~1000	2.24	-50.92	≤-17.76	PASS
			1000~26500	2.24	-34.85	≤-17.76	PASS
BLE_2M	Ant1	2402	Reference	1.31	1.31	---	PASS
			30~1000	1.31	-52.85	≤-18.69	PASS
			1000~26500	1.31	-34.29	≤-18.69	PASS
		2440	Reference	-0.99	-0.99	---	PASS
			30~1000	-0.99	-53.64	≤-20.99	PASS
			1000~26500	-0.99	-34.55	≤-20.99	PASS
		2480	Reference	-0.59	-0.59	---	PASS
			30~1000	-0.59	-53.77	≤-20.59	PASS
			1000~26500	-0.59	-33.17	≤-20.59	PASS
BLE_125K	Ant1	2402	Reference	-0.88	-0.88	---	PASS
			30~1000	-0.88	-52.57	≤-20.88	PASS
			1000~26500	-0.88	-34.21	≤-20.88	PASS
		2440	Reference	-0.48	-0.48	---	PASS
			30~1000	-0.48	-53.15	≤-20.48	PASS
			1000~26500	-0.48	-34.36	≤-20.48	PASS
		2480	Reference	-0.58	-0.58	---	PASS
			30~1000	-0.58	-52.65	≤-20.58	PASS
			1000~26500	-0.58	-33.86	≤-20.58	PASS
BLE_500K	Ant1	2402	Reference	0.90	0.90	---	PASS
			30~1000	0.90	-53.49	≤-19.1	PASS

			1000~26500	0.90	-34.07	≤-19.1	PASS
		2440	Reference	2.11	2.11	---	PASS
			30~1000	2.11	-53.18	≤-17.89	PASS
			1000~26500	2.11	-34.38	≤-17.89	PASS
		2480	Reference	1.42	1.42	---	PASS
			30~1000	1.42	-52.57	≤-18.58	PASS
			1000~26500	1.42	-33.99	≤-18.58	PASS

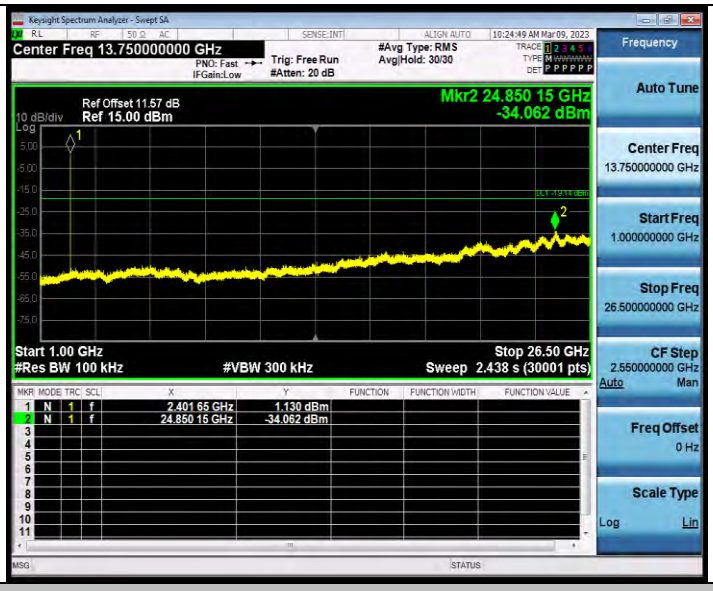
TEST GRAPHS

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000



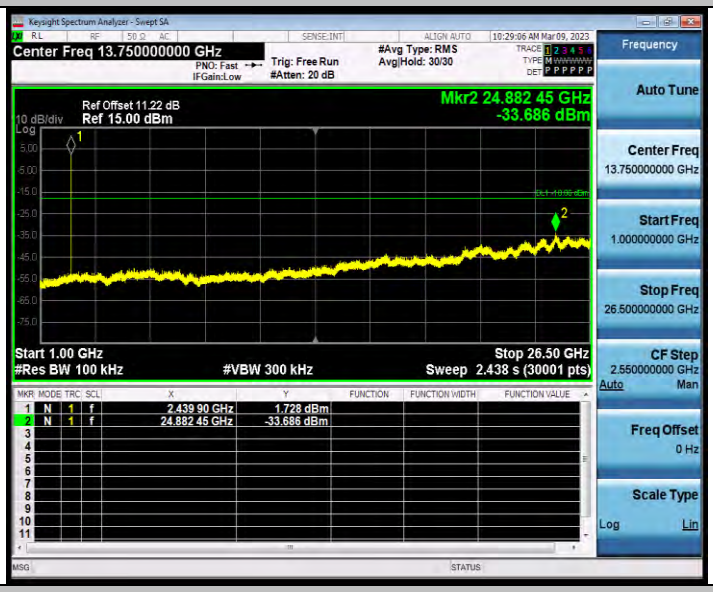
BLE_1M_Ant1_2402_1000~26500



BLE_1M_Ant1_2440_0~Reference

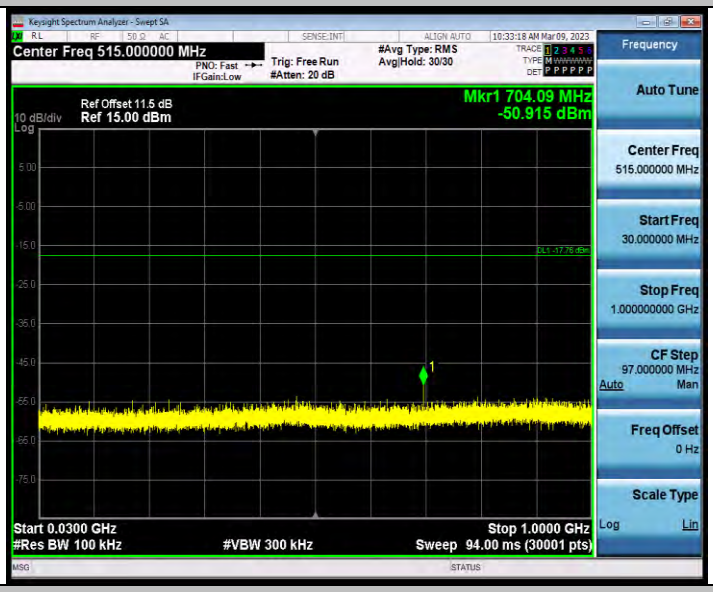
BLE_1M_Ant1_2440_30~1000

BLE_1M_Ant1_2440_1000~26500

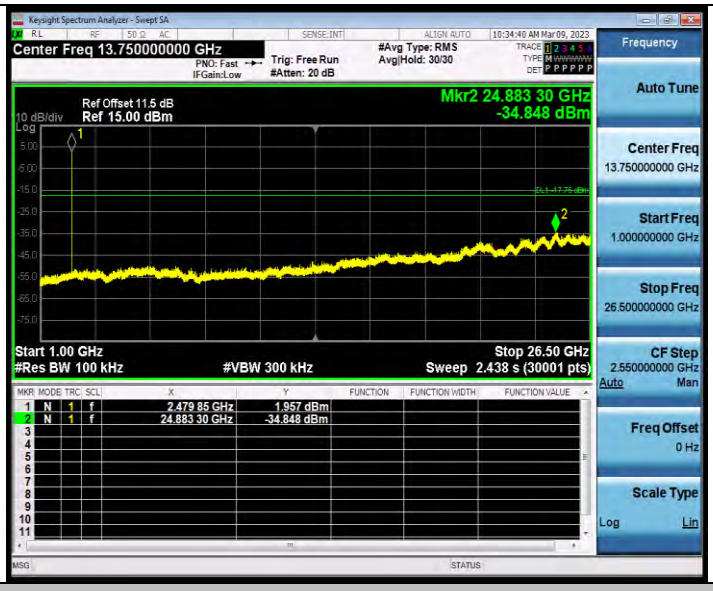


BLE_1M_Ant1_2480_0~Reference

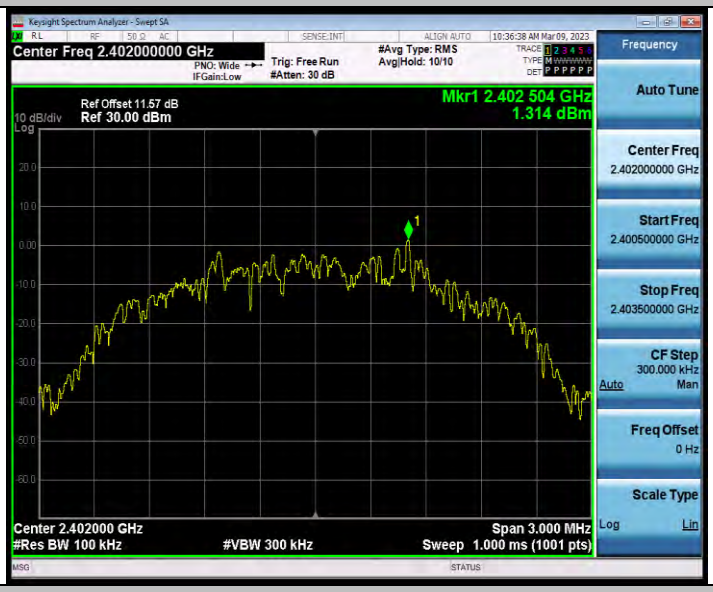
BLE_1M_Ant1_2480_30~1000



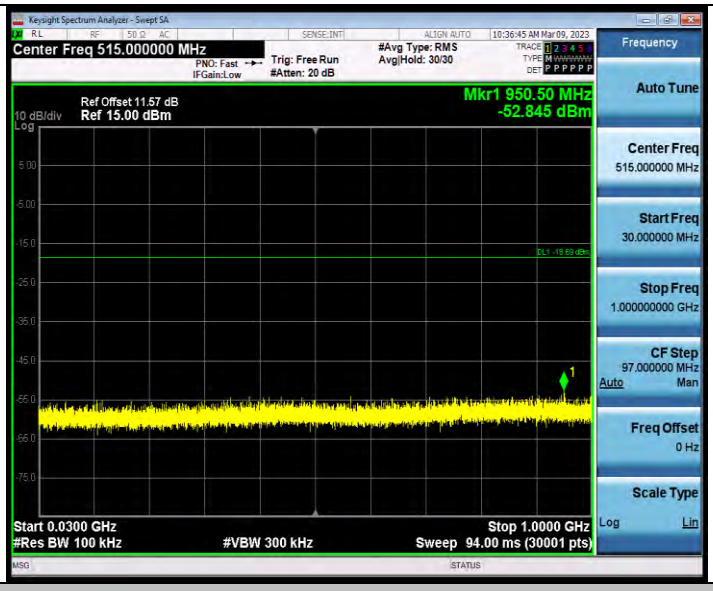
BLE_1M_Ant1_2480_1000~26500



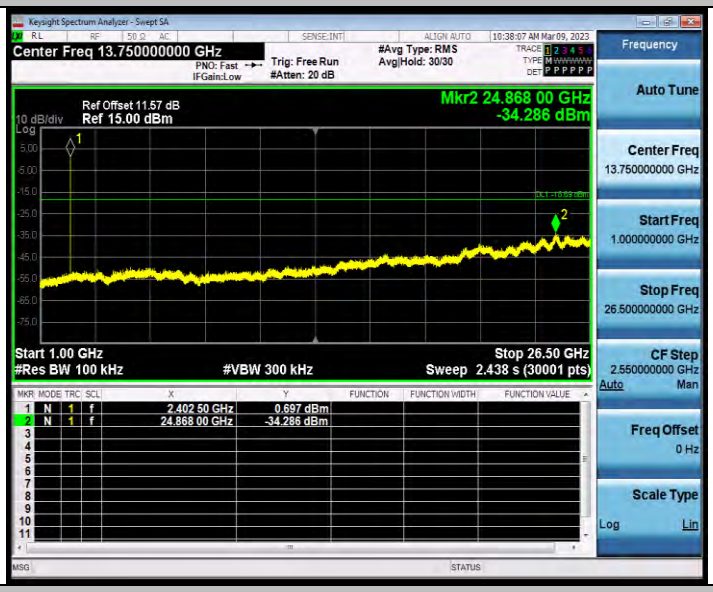
BLE_2M_Ant1_2402_0~Reference



BLE_2M_Ant1_2402_30~1000

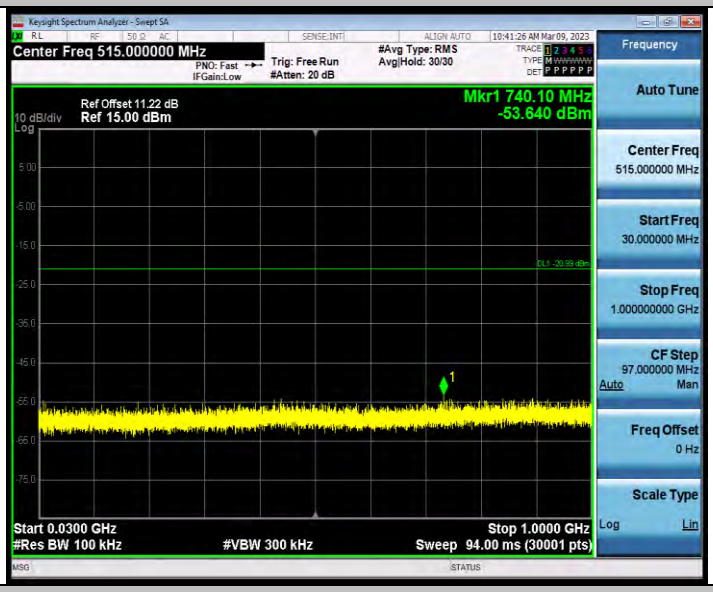


BLE_2M_Ant1_2402_1000~26500

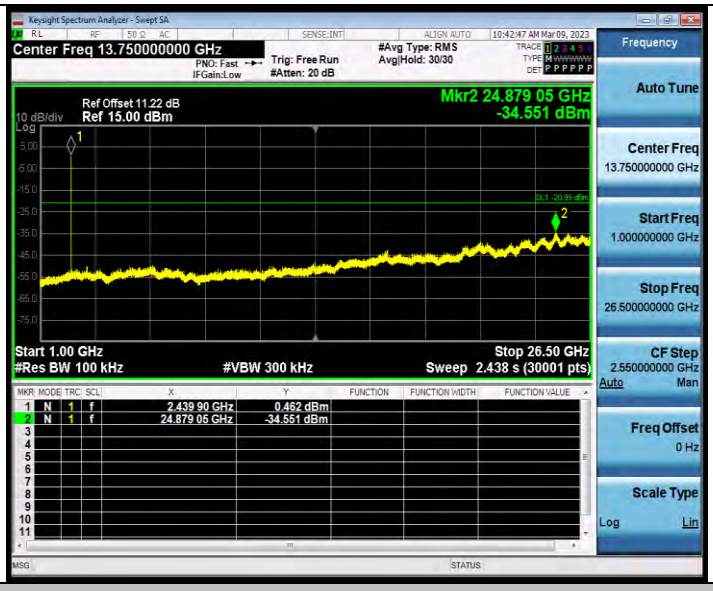


BLE_2M_Ant1_2440_0~Reference

BLE_2M_Ant1_2440_30~1000

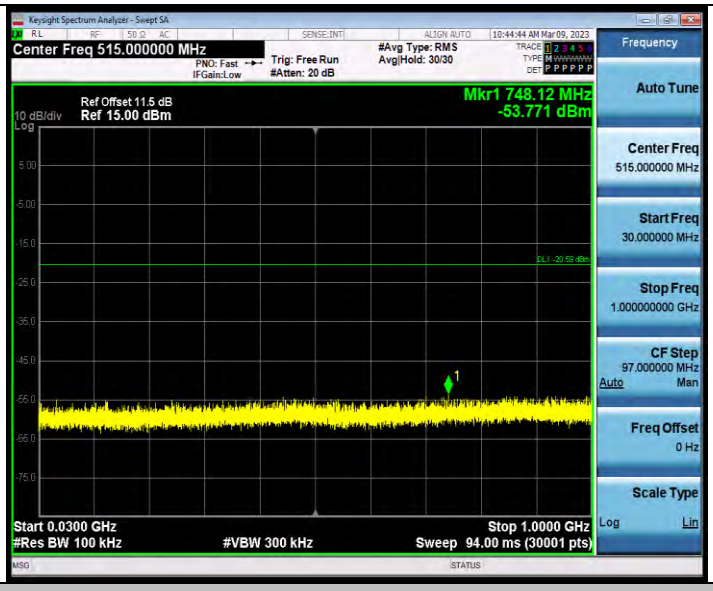


BLE_2M_Ant1_2440_1000~26500

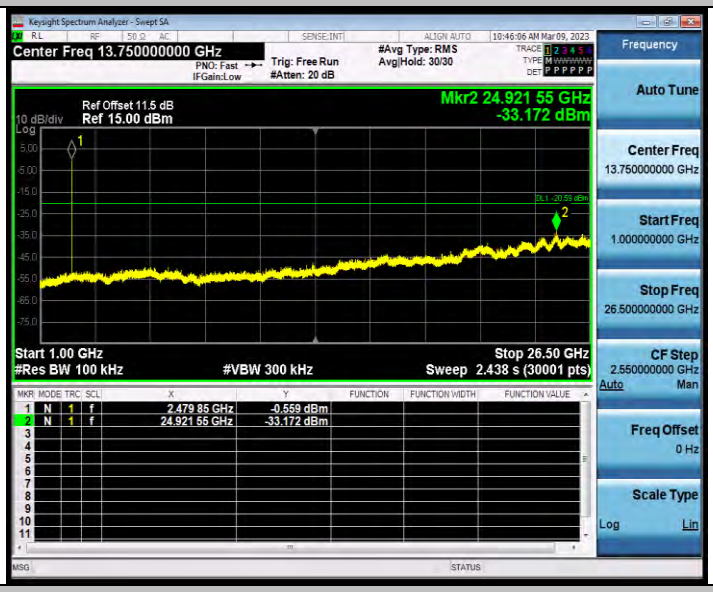


BLE_2M_Ant1_2480_0~Reference

BLE_2M_Ant1_2480_30~1000

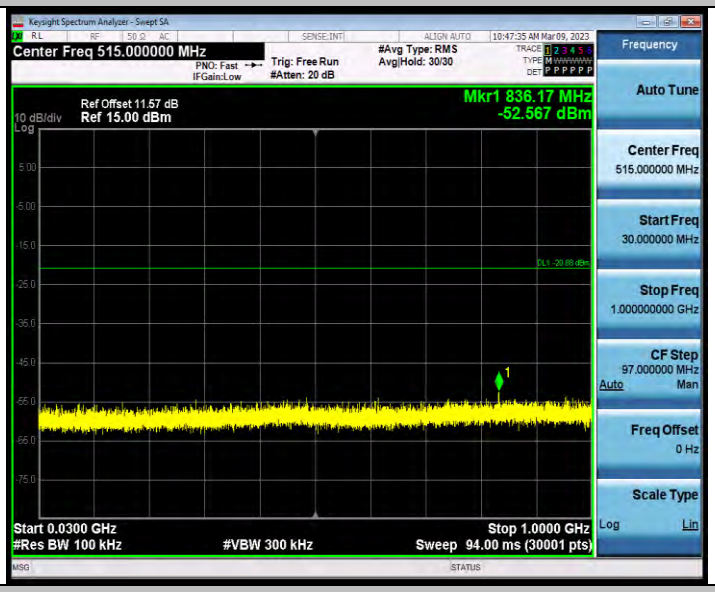


BLE_2M_Ant1_2480_1000~26500

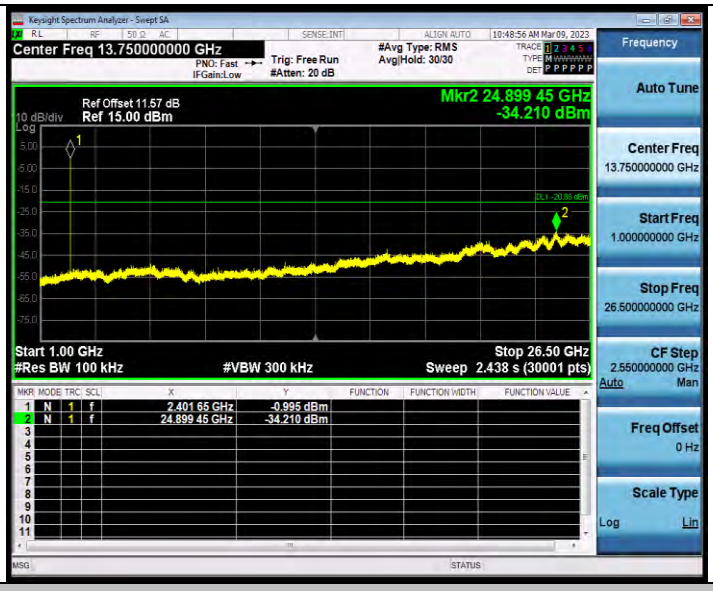


BLE_125K_Ant1_2402_0~Reference

BLE_125K_Ant1_2402_30~1000



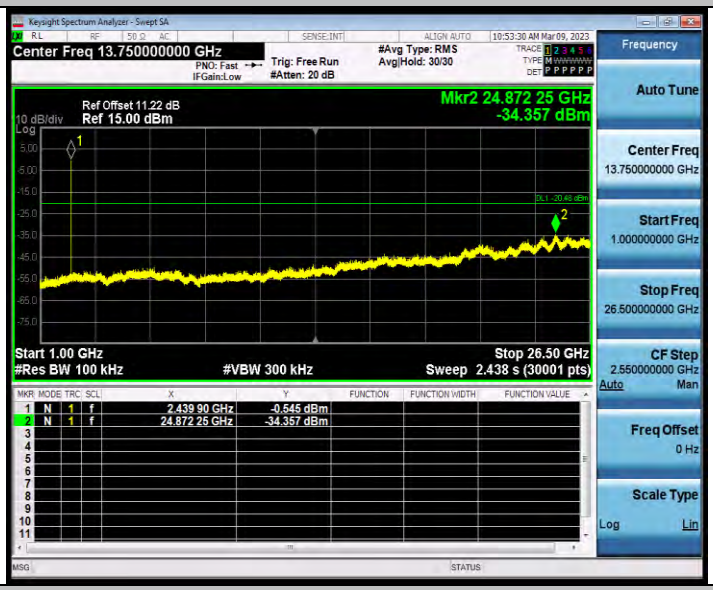
BLE_125K_Ant1_2402_1000~26500



BLE_125K_Ant1_2440_0~Reference

BLE_125K_Ant1_2440_30~1000

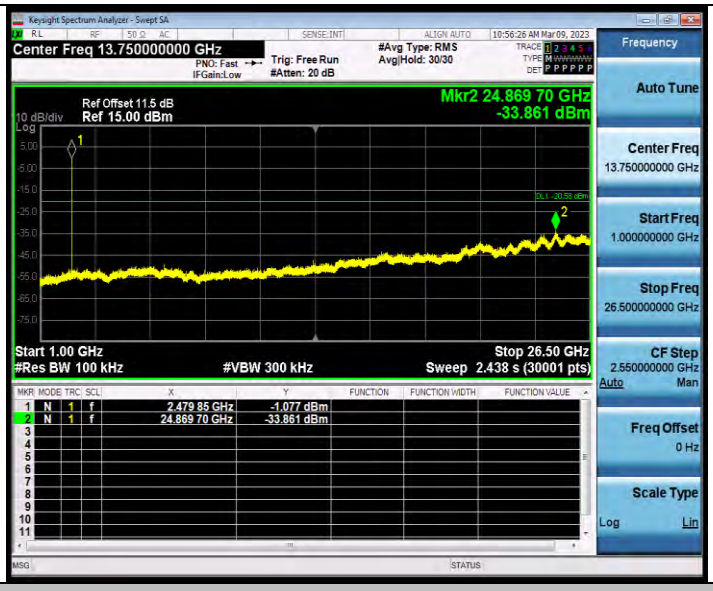
BLE_125K_Ant1_2440_1000~26500



BLE_125K_Ant1_2480_0~Reference

BLE_125K_Ant1_2480_30~1000

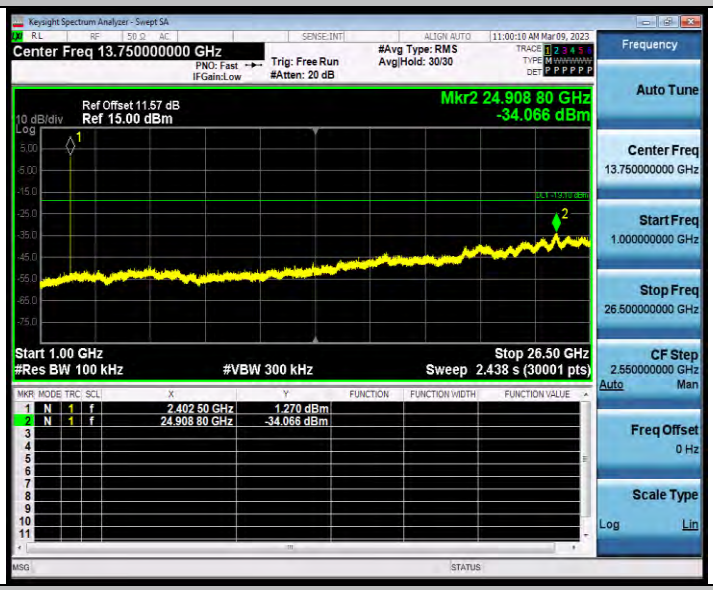
BLE_125K_Ant1_2480_1000~26500



BLE_500K_Ant1_2402_0~Reference

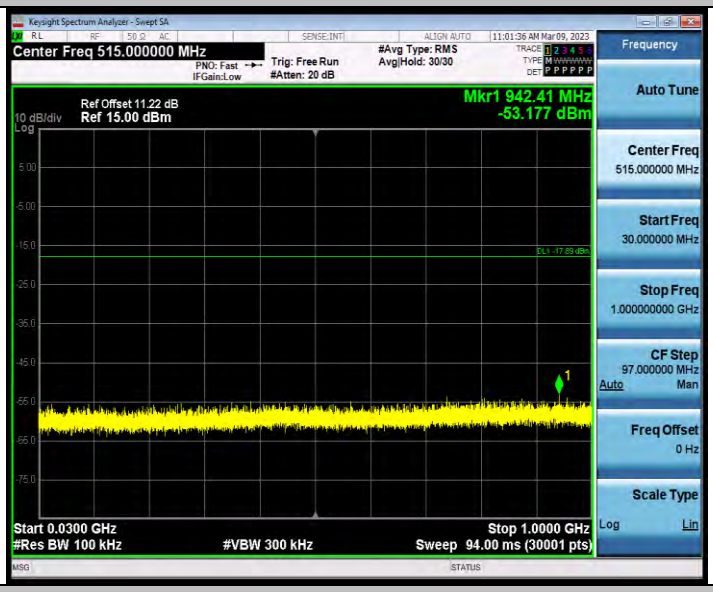
BLE_500K_Ant1_2402_30~1000

BLE_500K_Ant1_2402_1000~26500

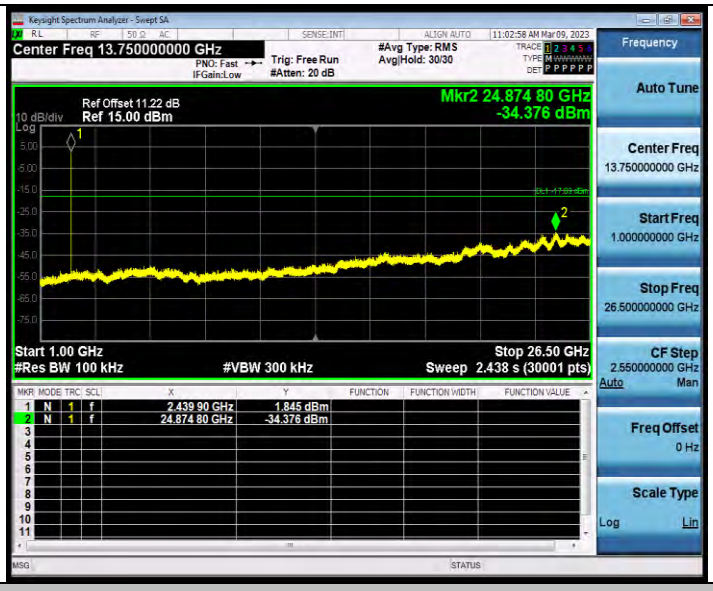


BLE_500K_Ant1_2440_0~Reference

BLE_500K_Ant1_2440_30~1000



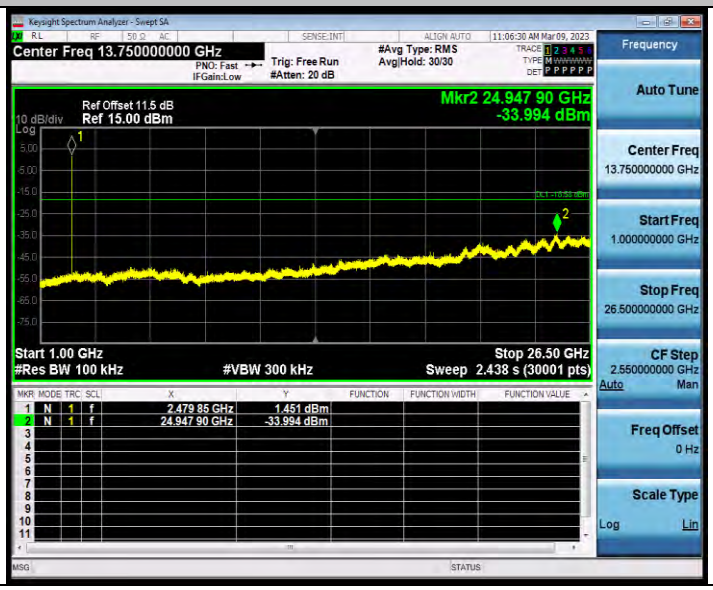
BLE_500K_Ant1_2440_1000~26500



BLE_500K_Ant1_2480_0~Reference

BLE_500K_Ant1_2480_30~1000

BLE_500K_Ant1_2480_1000~26500



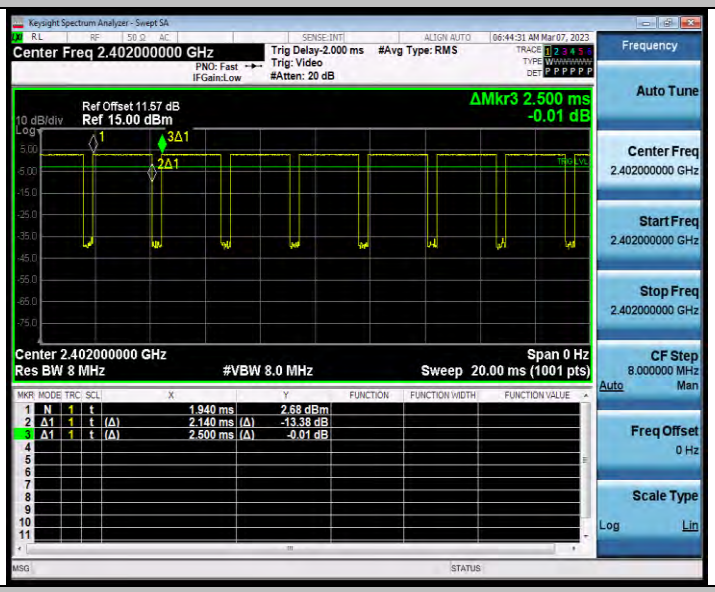
DUTY CYCLE

TEST RESULT

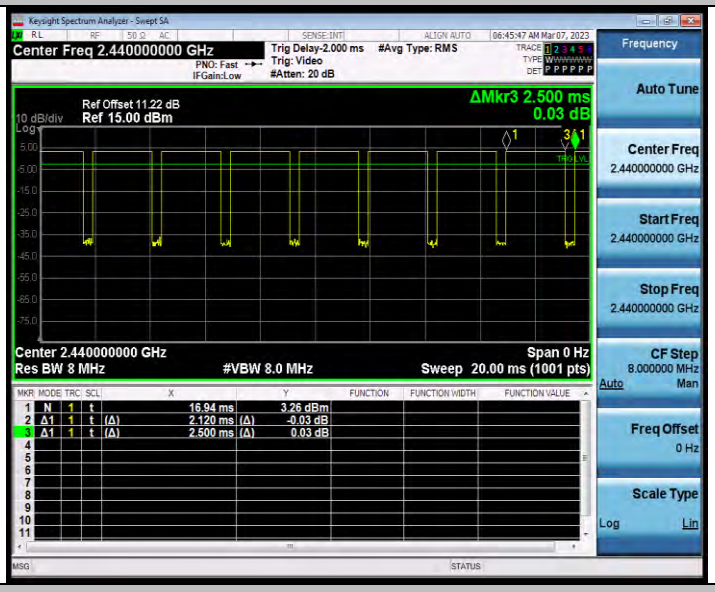
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	2.14	2.50	85.60	0.68
		2440	2.12	2.50	84.80	0.72
		2480	2.12	2.50	84.80	0.72
BLE_2M	Ant1	2402	1.06	1.88	56.38	2.49
		2440	1.06	1.88	56.38	2.49
		2480	1.06	1.88	56.38	2.49
BLE_125K	Ant1	2402	17.04	17.52	97.26	0.12
		2440	17.04	17.52	97.26	0.12
		2480	17.04	17.52	97.26	0.12
BLE_500K	Ant1	2402	4.54	5.00	90.80	0.42
		2440	4.56	5.00	91.20	0.40
		2480	4.54	5.00	90.80	0.42

TEST GRAPHS

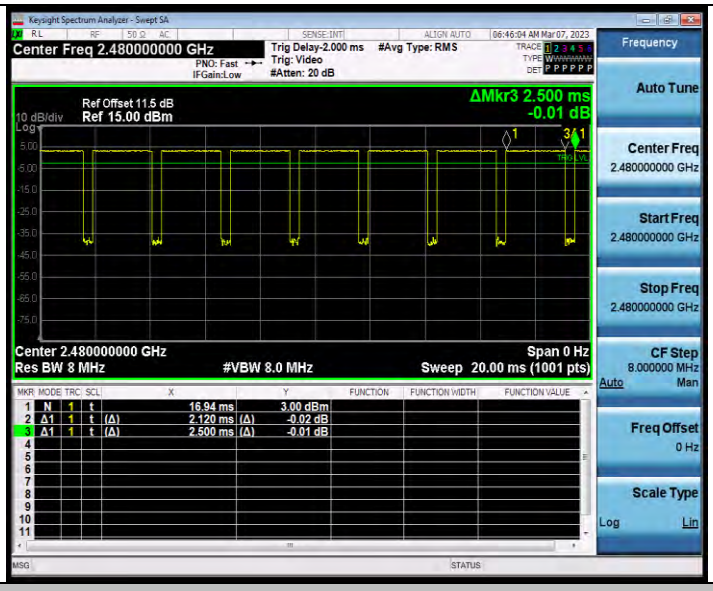
BLE_1M_Ant1_2402



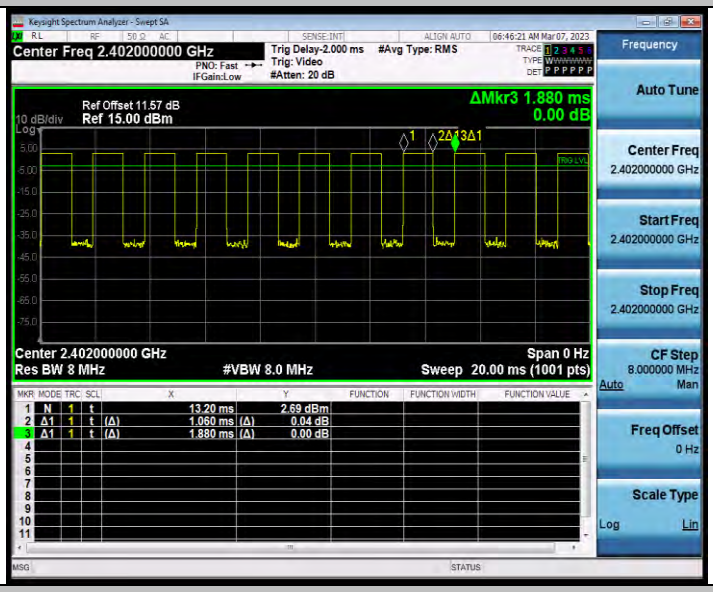
BLE_1M_Ant1_2440



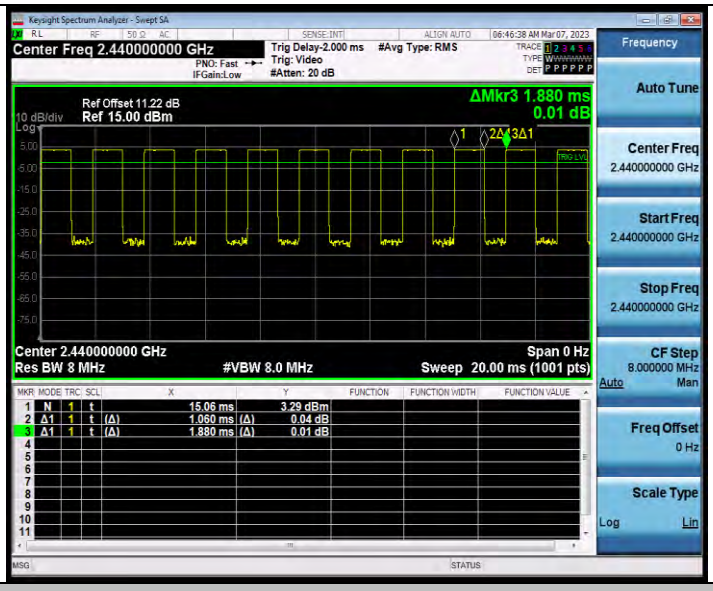
BLE_1M_Ant1_2480



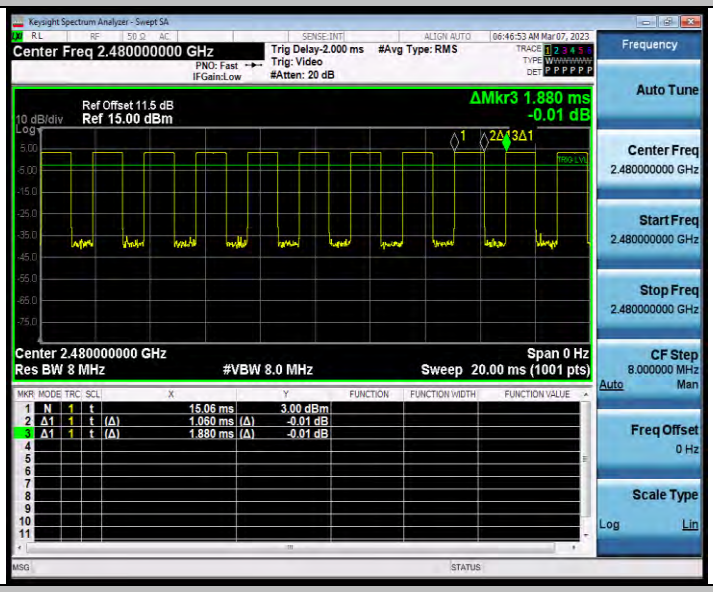
BLE_2M_Ant1_2402



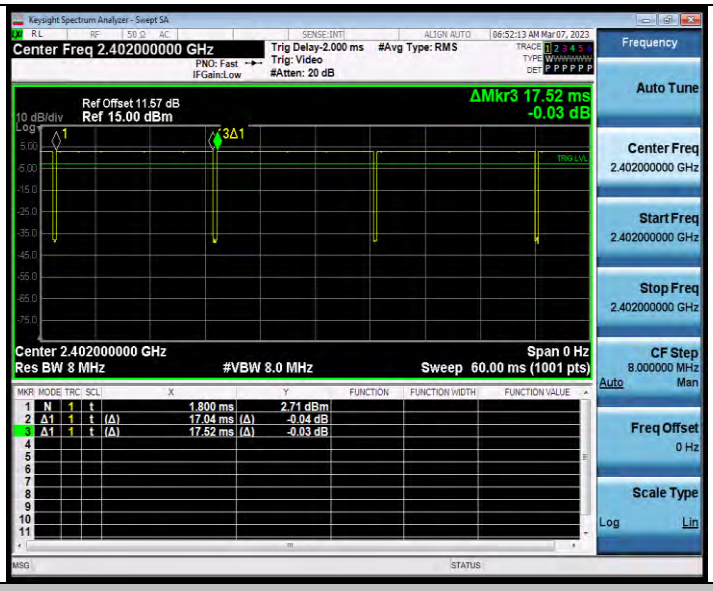
BLE_2M_Ant1_2440



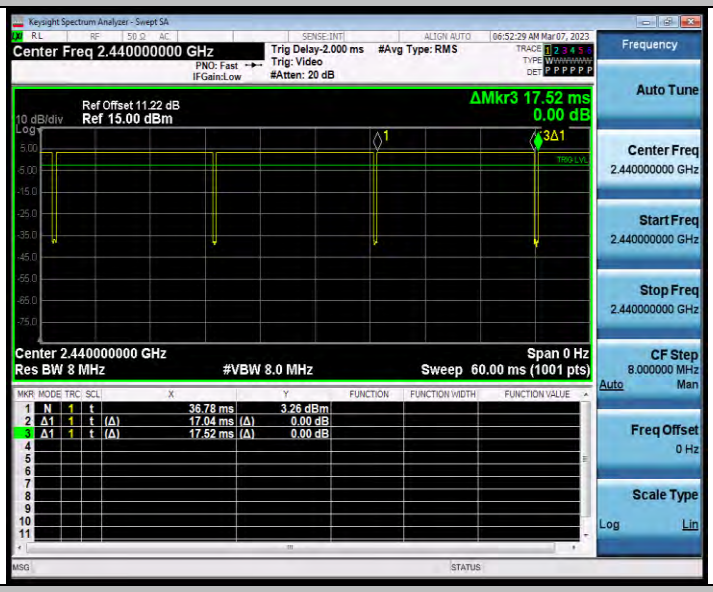
BLE_2M_Ant1_2480



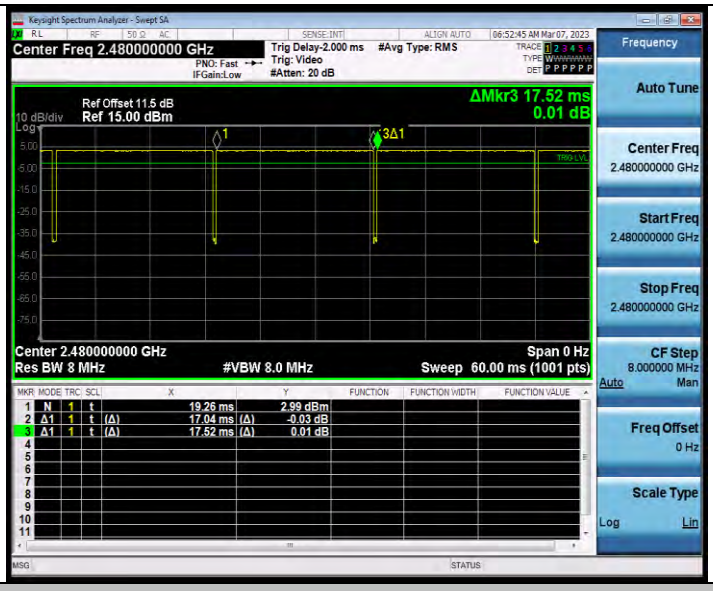
BLE_125K_Ant1_2402



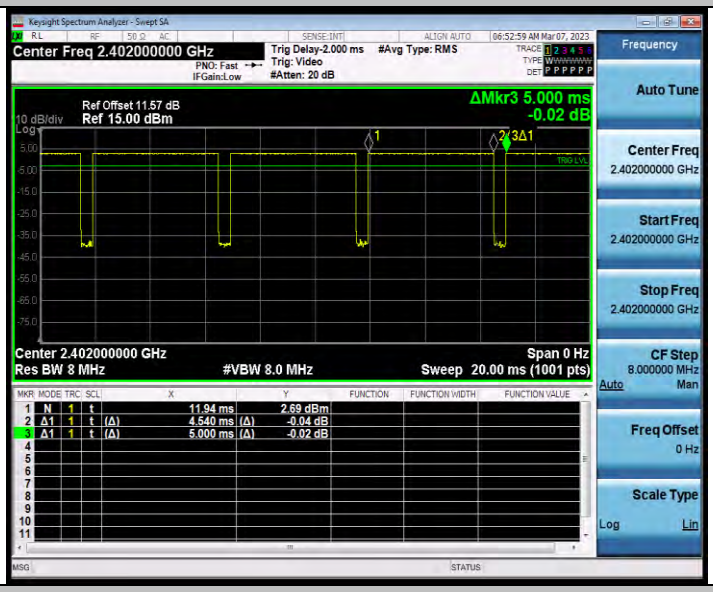
BLE_125K_Ant1_2440



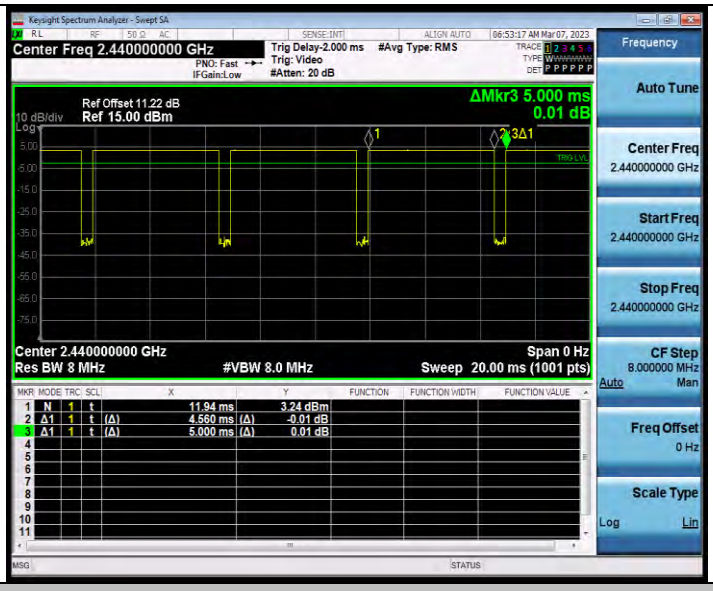
BLE_125K_Ant1_2480



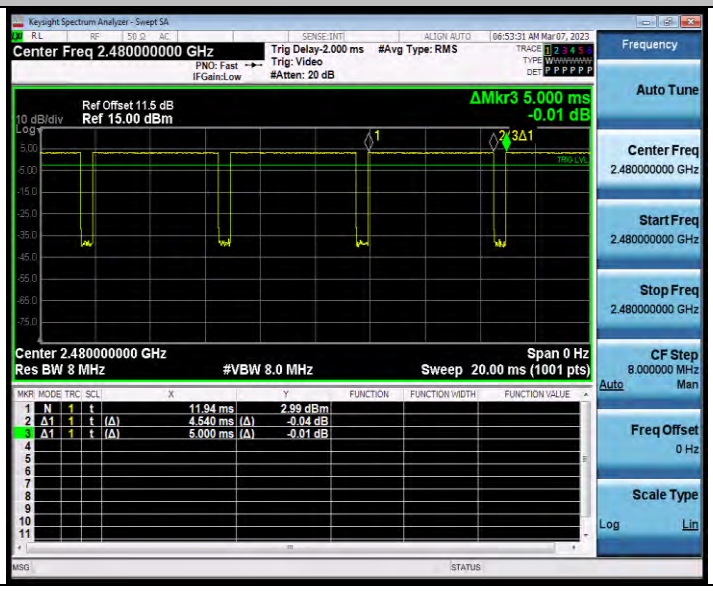
BLE_500K_Ant1_2402



BLE_500K_Ant1_2440



BLE_500K_Ant1_2480



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